SUBJECT DATASHEET

QUANTITATIVE METHODS

BMEGT20M011

I. SUBJECT DESCRIPTION

1. SUBJECT DATA

Subject name
QUANTITATIVE METHODS

ID (subject code)	BMEGT20M011

Type of subject
Contact lessons

Course types and lessons

Type	*Lessons*
Lecture	2
Practice	2
Laboratory	0

Type of assessment
term grade

Number of credits
5

Subject Coordinator

Name	*Position*	*Contact details*
Erdei János	senior lecturer	erdei.janos@gtk.bme.hu

Educational organisational unit for the subject
Department of Management and Business Economics

Subject website
https://edu.gtk.bme.hu

Language of the subject
magyar - HU; angol - ENG

Curricular role of the subject, recommended number of terms

Direct prerequisites

Strong	None
Weak	None
Parallel	None
Exclusion	None

Validity of the Subject Description
Approved by the Faculty Board of Faculty of Economic and Social Sciences, Decree No: 580393/12/2023 registration number. Valid from: 31.05.2023.

2. OBJECTIVES AND LEARNING OUTCOMES

Objectives

The basic aim of the subject is to bring the knowledge acquired during the BSc degree to a same level, and in addition to acquaint the students with the basic mathematical knowledge and methods on which the theories and methods of business life are based. The aim of the subject is for the students to get to know the theoretical background in such depth that they can later use it independently, creatively in their further studies, as well as in practice.

Academic results

Knowledge

1. Know the generally used definitions of probability studay, mathematical statistic,
2. Know the axiom system, principles of probability studay, operations with events,
3. Know the most important theoretical distributions and probability definitions with them,
4. Know the steps of mathematical statistical data analysis, the statistical conclusion methods,
5. Know the essence of descriptive statistical processing, its indicators, the way in which the confidence interval is determined, its meaning, the general steps of statistical hypothesis tests, the practical application of the tests,
6. Know the principles, indicators and steps of correlation and regression analysis,
7. Know the basic concepts of decision theory, decision classes, criterias, problems of team decision, application of rank methods.

Skills

1. Using the learned theories and methods, identify, systematize and analyze facts and basic connections, formulate independent conclusions, critical remarks, makes decision-making proposals, and makes decisions in routine and partly unknown - domestic and international - environments.
2. Are able to apply techniques for solving economic / technical / technological problems, problem solving methods, their application conditions and limitations.
3. Are able to calculate economic/product/technological indicators and from that draw conclusions.

Attitude

1. Have the ability of problemdetection- and solving,
2. Are constructive, cooperative and initiative in case of teamwork,
3. Seek to cooperation in multidisciplinary teamwork.

Independence and responsibility

1. Are suitable to work independently (to choose methodology, technique; to organize, plan, manage the work; to collect, organize, analyze, evaulate data; general and professional improvement),
2. Apply systematic way in thinking,
3. Take responsibility for analysis, conclusion and decision.

Teaching methodology

Lectures, calculation tasks, communication in written and oral form, usage of IT tools and techiques, optional independent and in team performed tasks.

Materials supporting learning

- Kövesi J. – Erdei J. Tóth Zs. E.: Kvantitatív módszerek, oktatási segédanyag, BME GTK, Budapest, 2015,
- Árva G. – Erdei J. – Kövesi J. – Tóth Zs. E.: Kvantitatív módszerek, feladatgyűjtemény megoldásokkal, oktatási segédanyag, BME GTK, Budapest, 2015
- Egyéb, az oktatók által kiadott oktatási segédletek (képletgyűjtemény, gyakorló feladatok, stb.)
- Iman R. L., Conover W. J.: Modern Business Statistics, Wiley, 1989.
- Hunyadi L. - Vita L.: Statisztika közgazdászoknak, KSH, Budapest, 2002
- Kerékgyártóné, Gy. - Sugár, A. - Mundruczó Gy: Statisztikai módszerek és alkalmazásuk a gazdasági, üzleti elemzésekben, KSH, 1996

II. SUBJECT REQUIREMENTS

TESTING AND ASSESSMENT OF LEARNING PERFORMANCE

General Rules

The assessment of the learning outcomes formulated in point 2.2 takes place in the form of three midterms and optional partial performance
evaluation (active participation).

Performance assessment methods

1. Performance assessment: During the semester, the learning of the curriculum is checked with three midterm tests. All three of the midterm tests materials are the material from the weeks before. Midterm tests are from theoretical questions, tests and task solutions. Only the published formulas collection, tables and calculators, not exceeding the level of the scientific calculator, may be used in the midterm test. Other supporting tools (notebooks, computers, mobile phones, etc.) cannot be used. A mobile phone or other communication
device that is turned on during the midterm test must not be with students. Manual notes or additions can not be in the formulas collection
or tables. The formulas collection used in midterm test are checked one by one. If notes are found in the formulas collection, the student is missed the midterm test. 2. Partial performance assessment (active participation): the subject's knowledge, optional performance
assessment, method of completion and the level of gathered scores are determined by the subject's lecturer. The gathered score in a partial performance assessment for each student shall not exceed 25% of the maximum score of the summary performance assessment for
that part of the curriculum. 3. There is no minimum score for summary performance assessments, and together with all midterm tests (plus the score obtained in the partial performance assessment) the 50% limit required to gather the term grade must be reached.

Percentage of performance assessments, conducted during the study period, within the rating

- **1. summary performance assessment**: 25
- **2. summary performance assessment**: 35
- **3. summary performance assessment**: 40
- **active participation**: 25
- **total**: 100

Percentage of exam elements within the rating

Conditions for obtaining a signature, validity of the signature

Issuing grades

Excellent	94
Very good	84–94
Good	72–83
Satisfactory	60–71
Pass	50–59
Fail	0-49

Retake and late completion

1) After the periods with classes, the three midterm tests can be replaced/retaken together, in one repeat test. The result gathered at the rateking will count as the final result. Students who have not gathered the midterm grade after the replacement, will not fulfil the subject as there is no repeat of the repeat test. 2) The active participation cannot be replaced, improved or otherwise repla

Coursework required for the completion of the subject

részvétel a kontakt tanórákon	48
félévközi készülés a gyakorlatokra	24
felkészülés a teljesítményértékelésekre	42
kijelölt írásos tananyag önálló elsajátítása	36
összesen	150

Approval and validity of subject requirements

Consulted with the Faculty Student Representative Committee, approved by the Vice Dean for Education, valid from: 08.05.2023.

III. COURSE CURRICULUM

THEMATIC UNITS AND FURTHER DETAILS

Topics covered during the term

To achieve the learning outcomes set out in section 2.2, the course consists of the following areas and topics. In the syllabuses of the courses advertised in each semester, these elements are scheduled according to the calendar and other conditions.

1 Introduction - Probability calculation basics: probability calculation subject, stochastic events, event algebra basics, operations with events, probability concept, axiom system.

2 Methods for determining probability, concept of conditional probability, independence of events, probability calculation items.

3 Probability variables: distribution function, discrete and continuous probability variables, independence of probability variables, expected value, standard deviation, additional characteristics of probability variable.

4 Notable probability distributions: characteristic, binomial, Poisson, hypergeometric, discrete uniform, continuous uniform, exponential, normal.

5 Laws of big numbers, central boundary distribution.

6 Mathematical statistical basis, subject of mathematical statistics, sampling, number, criteria, purpose and methods of descriptive statistics.

7 Sampling and estimation: estimation of parameters, characteristics of the estimation, methods of point estimation, intervallum estimation.

8 Hypothesis test: purpose, tools, general course, grouping of statistical tests, nonparameter tests.

9 Application of parameter tests.

10 Correlation and regression calculation: type of relationships, two- and multi-variable regression model, metrics, regression model testing, interpretation of results.

11 Decision theory basics, decision classes, criteria.

12 Group decision, pair comparison, application of rank methods

Additional lecturers

Dr.Kövesi János	Professor Emeritus	kovesi.janos@gtk.bme.hu
Fatma Aslan	researcher	aslan.fatma@gtk.bme.hu

Approval and validity of subject requirements